

4b Analysis for Bear, Burley, and Purdy Creeks

The Washington Department of Ecology (Ecology) Integrated Report (IR), which was submitted to EPA in May 2008, has excluded ten listings for fecal coliform in Burley Creek (10371, 10370, 10373, 10374, 53098, 53099), Bear Creek (10375, 10376), and Purdy Creek (10389, 10387) from the 303(d) list and placed these waterbodies in category 4b of the IR. Listing 10374 on Burley Creek was listed in category 2 of the 2004 IR. Listings 53098 and 53099 on Burley Creek are new listings. All other water bodies were listed in category 4b of the 2004 IR. Ecology's basis for excluding these waterbodies from the 303(d) list is outlined in this evaluation.

Identification of Segment and Statement of Problem Causing Impairment

In January 1999, the Washington State Department of Health downgraded 110-acre Burley Lagoon from *Approved* to *Restricted* for shellfish harvesting due to marine fecal coliform levels in excess of the water quality criteria for *Approved* shellfish growing areas. Shortly afterward, Kitsap and Pierce counties were required to develop and implement a Shellfish Closure Response pursuant to RCW 90.72, *Shellfish Protection Districts*. In conjunction with the Shellfish Closure Response Committee, and with assistance from an Ecology On-Site/Shellfish Grant, Kitsap County Health District began a Pollution Identification and Correction (PIC) project in the Bear, Burley and Purdy Creek watershed in 2000.

Description of Pollution Controls and How They Will Achieve Water Quality Standards

In 1993, the Kitsap County Board of Commissioners adopted Ordinance 156-1993, establishing the Kitsap County Surface and Stormwater Management Program (KCSSWM). The goals of the program are to:

- Protect public health and natural resources.
- Minimize institutional costs.
- Obtain support for the program from other municipalities, tribal governments, and county residents.
- Meet state and federal regulatory requirements.
- Provide a permanent funding source to address nonpoint source pollution.

The county's intent is to meet Washington's numeric criteria for fecal coliform by eliminating anthropogenic sources and to stay in compliance in the future through an on-going monitoring and correction program.

Surface and Stormwater Management Program (SSWM) fees are assessed on properties in the unincorporated area of Kitsap County. Fees appear on annual property tax billings. The 2008 budget for the SSWM is \$5.6 million.

Funds are shared by the Kitsap County Public Works Department, which oversees the entire program; the Kitsap County Health District, which performs water quality monitoring, pollution identification and control, and wellhead protection programs; the

Kitsap County Department of Community Development, which uses the funds for watershed planning; and the Kitsap Conservation District, which helps with agricultural landowner technical assistance, education, and source control.

The PIC Program uses water quality monitoring data to identify priority water bodies for clean up. The primary focus of the monitoring program is to assess long-term pollution trends associated with human sewage and animal waste from nonpoint sources. Health district staff sample water quality monthly at approximately 95 stations on 54 streams and bimonthly at 67 marine stations. Field equipment measures turbidity, dissolved oxygen, pH, and temperature. Fecal coliform samples are analyzed by an Ecology accredited laboratory. Data are used to identify areas in need of pollution control and to evaluate the effectiveness of the correction program.

Clean up projects are designed to address the causes and sources of bacterial water pollution in specific geographic areas that the trend monitoring program has identified. SSWM provides funding for PIC projects. The goal of each PIC project is to:

- Protect public health.
- Protect shellfish resources.
- Preserve, protect, and restore surface water quality.

Through its monitoring program, the health district identified the sources of impairment in Burley and Purdy Creeks as:

- Failing on-site septic systems and
- Animal waste.

The best management practices (BMPs) being used to improve water quality include a requirement to properly operate and maintain on-site systems in the watershed. Kitsap County Health District (KCHD) is actively engaged in on-site system education, dye testing of suspect systems, and enforcement of the Bremerton-Kitsap County Board of Health's *Rules and Regulations Governing On-Site Sewage Systems* (BKCBH, 1998). In addition, the Kitsap Conservation District assists small farm owners and owners of livestock to implement BMPs for animal waste management and farm pollution control. The conservation district's role is as a non-regulatory agency. When a regulatory approach is needed, the Health District enforces the *Solid Waste Regulations* (KCBOH 2004-2).

Several enforceable pollution controls will assure that compliance with water quality standards is achieved.

- Kitsap County Ordinance 156-1993, establishing the Surface and Stormwater Management Program, which created an on-going, stable source of funding.
- Kitsap County Board of Health Ordinance 2008-11, *On-Site Sewage System and General Sewage Sanitation Regulations*, which requires proper design, installation, repair, operation and maintenance of on-site septic systems.
- Kitsap County Board of Health Ordinance 2004-2, *Solid Waste Regulations*, which regulate handling and disposal of animal manure and pet waste; animal waste violations are enforced by the Health District under this ordinance.

- RCW 90.72, *Shellfish Protection Districts*.

The PIC project was completed in 2002. The project identified and inventoried a total of 446 properties in the watershed. The PIC Program focused on properties that are most proximate to streams and have the highest potential impact, but because drainage systems can deliver stream pollutants from remote places in the watershed, the PIC Program elements were applied watershed-wide.

During the Bear, Burley and Purdy PIC project, 37 on-site system failures and 8 animal waste management violations were identified. 36 on-site violations were corrected and one system remains to be corrected. Of the 8 animal waste management violations identified, all 8 farm problems were rectified. Remaining and new sources continue to be identified and corrected as the Bear, Burley and Purdy Creek Project continues in the post corrective monitoring phase.

Kitsap County Health District continues to have regulatory presence in the Bear, Burley, and Purdy Creek watershed to:

- Track water quality trends in fecal coliform concentrations through the Health District's on-going, countywide monitoring program;
- Respond to sewage complaints and repair failing on-site sewage systems;
- The Health District is set to receive funding from Ecology to conduct a sanitary survey of 90 properties located along Burley Creek. This project should start in Summer 2008 and be completed in Summer 2009.
- Work with Kitsap CD to address additional farms found to be violating state water quality standards for fecal coliform.

Since 2005, 40 property surveys have been completed along Bear and Burley Creeks and 12 failing on-site sewage systems have been identified and repaired. In addition, the Kitsap Conservation district has continued farm planning and implementation of best management practices in the watershed. Five properties in the watershed have installed best management practices since 2005. One waste storage facility was installed. Four heavy use areas were installed to reduce contaminated runoff. One property installed a roof runoff management system, underground outlets, subsurface drain, and a grassed waterway. Another property installed two fencing projects and a pipeline to protect water quality. In the Purdy Creek portion of the watershed, one failing on-site sewage system was identified and corrected since 2005.

Estimate or Projection of Time When Water Quality Standards Will be Met

The designated uses for Bear and Burley Creeks are Core Summer Salmonid Habitat and Extraordinary Primary Contact Recreation. Washington's fecal coliform bacteria standard for these waters has two parts. Fecal coliform organism levels shall not exceed a geometric mean value of 50 colonies/100mL, with not more than 10% of all samples (or any single sample when less than 10 sample points exist) exceeding 100 colonies/100 mL. Water quality in Burley Creek went from a 12-sample geometric mean fecal coliform count of 140 in 2000 to a geometric mean of 120 in 2003. Some of the bacteria

archived in Burley Creek sediments is believed to be still flushing out. In 2004, based on an estimated incremental decrease in the fecal coliform geometric mean of 15 cfu per year, the county estimated that Burley Creek would attain the water quality standard geometric mean of 50 cfu/100 mL by 2008.

Burley and Bear Creeks continue failing to meet the state's fecal coliform standard. However, as shown below, results for the 2006-2007 water year show improvement

**Fresh Water Stream Fecal Coliform (FC) Results
Burley Creek (BL01), Water Years 1996 - 2003**

Water year	Number of Samples	Range (FC/100ml)	GMV¹ (FC/100ml)	# Samples > 100 FC/100ml	% Samples > 100 FC/100ml	Meets WQ Standard²
96	5	13 - 300	93	3	60%	No
97	9	39 - 1600	189	6	67%	No
98	11	34 - 671	175	10	91%	No
99	11	29 - 500	128	7	64%	No
00	9	30 - 240	92	5	56%	No
01	9	30 - 900	209	7	78%	No
02	12	13 - 280	80	5	42%	No
03	11	14 - 1600	134	8	73%	No
04	12	50 - 300	116	5	42%	No
05	12	50 - ≥1600	258	8	67%	No
06	12	11 - 900	107	6	50%	No
07	12	23 - 240	71	6	50%	No

Shaded entries indicate an exceedance of the applicable water quality standard (Chapt.173 – 201A-030 WAC)

¹ Geometric mean value

² State FC standard - FC levels shall not exceed a GMV of 50 FC/100ml and not have more than 10% of all samples exceed 100 FC/100 ml.

**Burley Creek
Station BL03**

Water Year	Number of Samples	Range (FC/100ml)	GMV	# >100FC	% >100FC	Meets Standard?
2006	8	7 - 170	41	3	38%	No
2007	12	4 - 240	33	3	25%	No

**Burley Creek
Station BL04**

Water Year	Number of Samples	Range (FC/100ml)	GMV	# >100FC	% >100FC	Meets Standard?
2006	8	2 - 170	30	2	25%	No
2007	12	4 - 170	32	2	17%	No

**Burley Creek
Station BL05**

Water Year	Number of Samples	Range (FC/100ml)	GMV	# >100FC	% >100FC	Meets Standard?
2006	8	8 - 500	38	2	25%	No
2007	12	<2 - 130	15	1	8%	Yes

Burley Creek
Station BL06

Water Year	Number of Samples	Range (FC/100ml)	GMV	# >100FC	% >100FC	Meets Standard?
2003	10	4 - 900	37	1	10%	Yes
2004	12	<2 - 500	24	2	17%	No
2005	12	<2 - 900	66	6	50%	No
2006	12	2 - 170	23	1	8%	Yes
2007	12	<2 - 170	21	2	17%	No

Bear Creek
Station BR01

Water Year	Number of Samples	Range (FC/100ml)	GMV	# >100FC	% >100FC	Meets Standard?
2003	10	17 - 900	79	4	40%	No
2004	12	50 - 500	167	9	75%	No
2005	12	30 - 1600	133	4	33%	No
2006	12	8 - 500	135	8	67%	No
2007	12	30 - 500	109	6	50%	No

In addition to ongoing fecal coliform monitoring, the Health District partnered with EPA Region 10 on a “Bacteriodes” study of 13 Kitsap County streams, including Burley Creek. Study results indicate that bacteriodes were present, indicating an active fecal source(s). However, EPA was not able to link the bacteriodes to any particular source. The Health District is hopeful that this source or sources can be identified during the upcoming survey.

Based on the county’s on-going presence in the watershed and continuing efforts to identify sources of fecal contamination and eliminate them, we estimate that the fecal coliform standard will be met by 2011 in Burley and Bear Creeks.

In 2004, the Kitsap County Health District believed that Purdy Creek was meeting water quality standards in water body 10387, as shown by the summary of water quality monitoring results.

Purdy Creek
1996 – 2004 Fresh Water Stream Fecal Coliform Results

Water year	Number of Samples	Range (FC/100ml)	GMV ¹ (FC/100ml)	# Samples > 100 FC/100ml	% Samples > 100 FC/100ml	Meets WQ Standard ²
96	5	8 – 300	50	1	20%	No
97	10	4 – 169	27	2	20%	No
98	11	2 – 502	40	1	9%	Yes

99	10	4 – 162	28	1	10%	Yes
00	10	4 – 170	29	1	10%	Yes
01	9	4 – 80	24	0	0%	Yes
02	12	8 – 900	43	2	17%	No
03	11	4 -240	38	3	27%	No
04	12	2 - 170	19	1	8%	Yes
05	12	2 - ≥1600	52	6	50%	No
06	12	<2 - 300	16	1	8%	Yes
07	12	<2 - 50	13	0	0%	Yes

Bold and shaded entries indicate an exceedance of the applicable water quality standard (Chapt.173 – 201A WAC).

¹ Geometric mean value

² Class AA - FC levels shall not exceed a GMV of 50 FC/100ml and not have more than 10% of all samples exceed 100 FC/100 ml.

County data show that Purdy Creek has met standards for the past two water years in water body 10387. The Health district plans to re-start sampling at station PR03, which corresponds to Ecology's station P3, located in water body 10389. The county hopes that this segment can be moved to Category 1 in the next IR.

Schedule for Implementing Pollution Controls

As described earlier in this report, Kitsap County has already implemented the PIC program and is continuing periodic monitoring, identifying problems, and fixing them. This is an on-going program, exactly what's needed to solve nonpoint pollution problems and to keep them from happening again.

Monitoring Plan to Track Effectiveness of Pollution Controls

Kitsap County has a countywide monitoring program, and monitors Bear, Burley, and Purdy Creeks as part of that on-going program. Samples are taken monthly and compared to the two parts of the fecal coliform standard. Assessment results are reported to the public and EPA through Ecology's IR report development process.

Commitment to Revise Pollution Controls as Necessary

Ecology will continue to work with Kitsap County to ensure that the PIC program continues and that water quality in Bear, Burley, and Purdy Creeks continues to improve. We fully expect the program to achieve compliance with water quality standards. However, if it does not, Ecology will work with Kitsap County to determine other controls that could be used to achieve compliance.